

## **OWENIA × RELIQUA (MELIACEAE), A NEW HYBRID FROM QUEENSLAND**

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### **Summary**

Individuals intermediate in characters considered diagnostic for *Owenia acidula* F. Muell. and *O. venosa* F. Muell. have been recorded for a number of localities in southern and central Queensland. These intermediate individuals are rarely encountered in the region where the two species are parapatric. There is no evidence of clinal gradation between *O. venosa* and *O. acidula*. The intermediate individuals are considered to be hybrids based on phenotypic and ecological evidence and are described as *O. × reliqua*.

### **Introduction**

When Mueller (1857) described the genus *Owenia* he included four species, namely *O. acidula* F. Muell., *O. venosa* F. Muell., *O. cerasifera* F. Muell. (conspecific with *Pleiogynium timorense* (DC.) Leenh.) and *O. reticulata* F. Muell. Mueller (1862) added *O. vernicosa* F. Muell. and *O. xerocarpa* F. Muell. (treated as conspecific with *O. reticulata* by Bentham (1863)), and Domin (1927) described *O. capitis-york* from north Queensland.

In south-eastern and central Queensland, two species, *O. acidula* and *O. venosa*, have been recorded. The character most commonly used to distinguish these taxa is the number of leaflets per leaf, *O. acidula* having seven or more pairs of leaflets per leaf and *O. venosa* having three or four pairs of leaflets per leaf (Reynolds 1983). Other useful field characters by which the taxa can be distinguished are the light green to grey mature leaves and a tendency to sucker in *O. acidula* contrasted with dark green mature leaves and lack of a tendency to sucker in *O. venosa*. The flowers of both these species are very similar, but the mature fruit differ slightly in shape, those of *O. acidula* being globose-ovoid and those of *O. venosa* being globose. *O. acidula* is regarded as having a wide distribution over inland Queensland and reaches an eastern limit in the brigalow open forest/semi-evergreen vine thicket communities on black earths and related soil types as defined by Johnson (1984). *O. venosa* by comparison, appears to be restricted to south-eastern Queensland where it occurs in semi-evergreen vine thicket or araucarian microphyll vine forest on red krasnozem or related soil types.

During 1985, sterile material of an *Owenia* was collected south of Mundubbera (Forster 2241) that could not be satisfactorily placed to either *O. venosa* or *O. acidula* using the characters outlined above. The tree from which the specimen was taken had numerous suckers and leaves with five to seven pairs of leaflets that were intermediate in size between individuals of *O. venosa* and *O. acidula*. The plant was growing in *Eucalyptus crebra* open forest adjacent to cleared land formerly supporting brigalow open-forest. Similar plants (Forster 4828) were subsequently found in regrowth brigalow open-forest close by. Examination of herbarium material at the Queensland Herbarium revealed a small number of collections from central Queensland that also had this intermediate leaflet number and morphology.

Given the distinctiveness of both *O. venosa* and *O. acidula* the question arose whether these intermediate plants represented hybrids, part of a clinal intergradation between the two taxa, or a new species.

### **Materials and Methods**

Collections of *Owenia* were made throughout eastern Queensland and herbarium collections at BRI, NE and QRS were examined. A selection of specimens examined for *O. acidula* and *O. venosa* is given in **Appendix 1**.

**Leaf morphology:** For each collection examined: (1) the maximum number of leaflets per leaf was determined, and (2) leaflet length and width were measured from the top

five leaflets on any leaf selected at random. Leaflet length was compared to leaflet width (Fig. 1) to determine whether or not continuous variation existed between *O. venosa*, *O. acidula* and those considered intermediate.

**Floral morphology:** Few herbarium collections of the two *Owenia* species at the herbaria listed above are fertile. Out of a total of 92 collections examined, some 14 possessed flowers and 19 had fruit. Collections of fresh flowers were fixed in 70% alcohol or dried flowers reconstituted by boiling in water with a touch of detergent, and comparative morphological measurements made (Table 1).

### Results

Most herbarium and field collections are easily sorted to *O. venosa* or *O. acidula* by the colour of the dried leaves and leaflet shape and number (Figs 1 & 2). The flowers of all collections show little difference in a number of characters (Table 1). A number of collections cannot be equivocally placed with material of either *O. acidula* or *O. venosa* (Fig. 2), having foliage of a grey-green colour. These collections are also intermediate between *O. venosa* and *O. acidula* in terms of the leaflet number, leaflet length and width. The relationship between leaflet length and width is given in Figure 1. There is considerable variation in both *O. venosa* and *O. acidula* in these characters.

Based on herbarium records, parapatric populations of *O. venosa* and *O. acidula* have been recorded from the Biloela, Dalby, Theodore, Rockhampton and Mundubbera areas. Individuals of *O. acidula*, *O. venosa* and intermediate plants have been observed growing in close proximity in the Chinchilla area (D. & N. Hoy, pers. comm. 1989). In the Mundubbera area, no individuals of *O. venosa* or *O. acidula* were observed in the vicinity of the intermediate individuals, although both had been recorded from the general district (Kent [AQ347163] & Forster 3318).

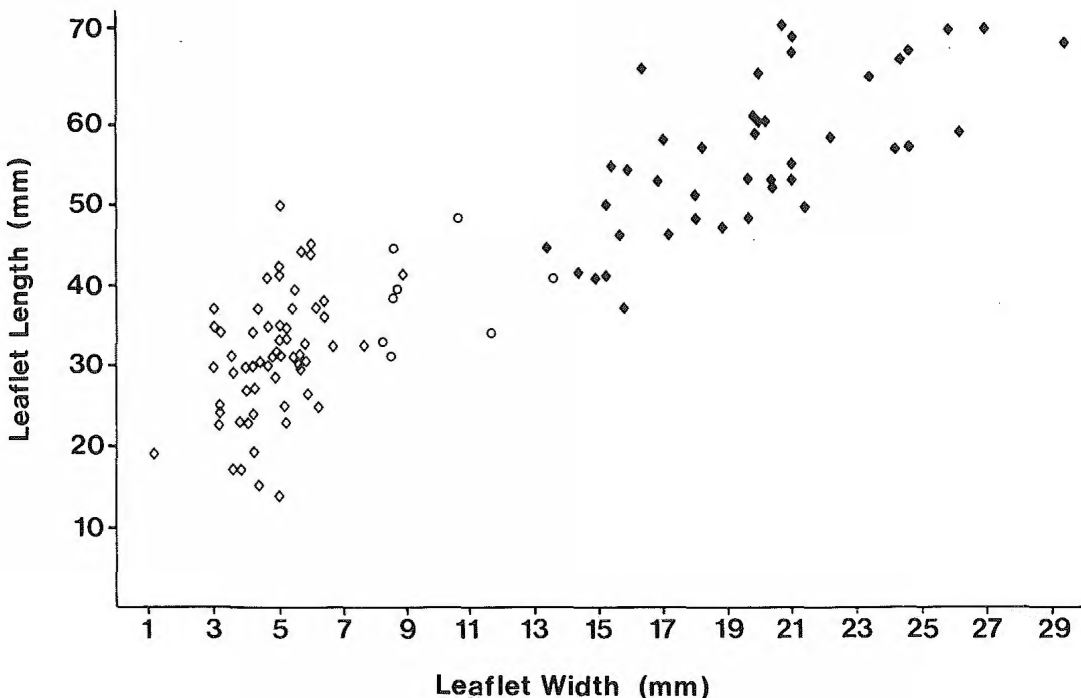


Fig. 1. Leaflet length versus leaflet width.  $\diamond$  *O. acidula*,  $\blacklozenge$  *O. venosa*,  $\circ$  *O. x reliqua*.

**Table 1.** Comparison of morphological characters for *Owenia venosa*, *O. acidula* and *O. × reliqua*.

Character	<i>O. venosa</i>	<i>O. × reliqua</i>	<i>O. acidula</i>
suckers	absent	present	present
leaflet number	3–5	5–10	8–18
leaflet colour	dark green	grey-green	light green to grey
leaflet shape	elliptic-oblong to obovate-oblong	ovate-elliptic to linear-elliptic	narrowly linear to linear-ovate
leaflet length × width (mm)	36–75 × 13–30	30–50 × 7.5–14	10–52 × 1–9
panicle form	simple to thrysiform	simple to thrysiform	simple
pedicel length	c. 1 mm	c. 1 mm	sessile
sepal length (mm)	2	1–2.5	2–2.5
petal length × width (mm)	4.5 × 2.5	4 × 2.5	3–4 × 2.5
staminal tube × width (mm)	3–4 × 2.5	2.5–3 × 2	2.5–3.5 × 2
anther number	8–10	7–10	8
fruit shape	globose	globose	globose-ovoid
number of locules	4	3	3

### Discussion

The morphologically intermediate individuals described above (Table 1, Figs 1, 2C) are rarely encountered and only occur in regions where both *O. acidula* and *O. venosa* have been recorded or observed; therefore they do not represent clinal intergradation between these two species.

The area south of Mundubbera where these intermediate individuals of *Owenia* have been recorded is characterised by a complex mosaic of soils (de Mooy *et al.* 1977) with corresponding variation in the plant communities. Similar variation in soils and vegetation occurs in the Theodore and Biloela areas. Hence while *O. acidula* and *O. venosa* are usually well separated in south-east Queensland (Map 1), in these areas both taxa may occur parapatrically.

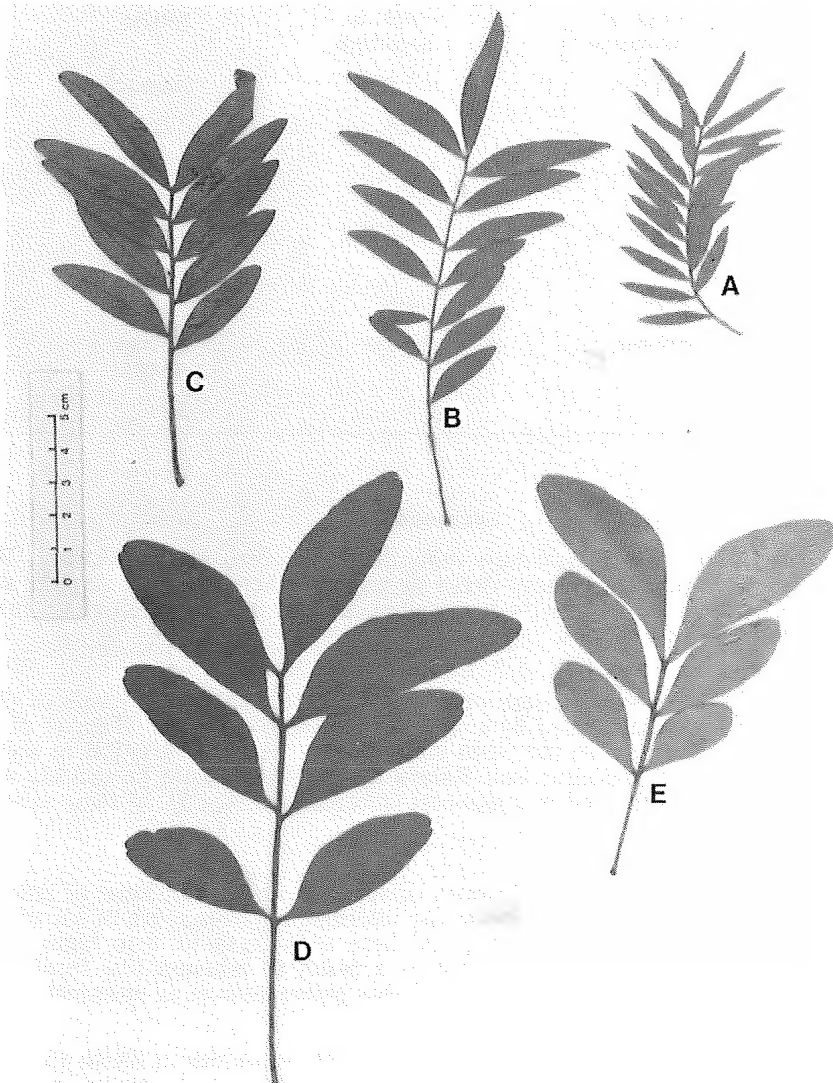
Mature individuals of *Owenia* species usually have a large number of fallen fruit beneath them, but this was not the case for the intermediate trees south of Mundubbera. A single fruit was observed on the largest of these individuals (c. 6 m high) in 1987. Whether this apparent low fruit production is a result of inherent low fertility or to failure of cross-pollination due to lack of available pollen sources is unknown.

The brigalow and semi-evergreen vine thicket communities in which these plants occur share many species or related species and are considered to be part of a structural and floristic gradation (Webb *et al.* 1984). It is probable that *O. venosa* and *O. acidula* are closely related and have radiated into different habitats while retaining the ability to interbreed, thus resulting in the hybrid formally described below.

### Taxonomic Treatment

**Owenia** × **reliqua** P. Forster, **hybrida nov.** Hybrida naturalis ale *O. venosa* F. Muell. et *O. acidula* F. Muell. genita, foliolis 5–10, ovatis-ellipticis ad linearis-ellipticis, 1.5–5 cm longis et 7.5–15 mm latis, et cinereo-viridibus inter parentes intermedia.  
**Typus:** Queensland. BURNETT DISTRICT: 4 km NW of "Toondahra", 25°57'S, 151°21'E, November 1988, *P.I. Forster* 4829 (holo: BRI; iso: K,L).

Spreading tree to 6 m high, suckering at some distance from primary trunk, with greyish black, rough, scaly bark. Stems resinous when young, becoming lenticellate with age, glabrous. Leaves paripinnate, 6–12 cm long; rachis rarely winged even when young, c. 1 mm wide; leaflets sessile, in 5–10 opposite or subopposite pairs, coriaceous, narrowly linear-elliptic to ovate-elliptic, 1.5–5 cm long, 6–15 mm wide, glabrous, dull grey-green above, paler below; apex obtuse to acute; base cuneate; margin entire and somewhat recurved, midrib prominent; fine secondary reticulate venation prominent below. Inflorescence a thrysiform panicle, 2–6 cm long, with 1–many flowers. Flowers campanulate,



**Fig. 2.** Comparison of leaves from *O. venosa*, *O. acidula* and *O. × reliqua*. A. *O. acidula*. B. *O. acidula*. C. *O. × reliqua*. D. *O. venosa*. E. *O. venosa*. A, Forster 3602; B, Forster 3603; C, Forster 3314; D, Forster 3315; E, Forster 3308.

3–3.5 mm long, 2–2.5 mm diameter, sessile. Sepals 5, ovate, 1–2.5 mm long, c. 1.5 mm wide, green. Petals 5, ovate-oblong, c. 4 mm long and 2.5 mm wide, green. Staminal tube 2.5–3 mm long, c. 2 mm diameter, irregularly toothed and fringed at top, green. Anthers 7–10, narrowly oblong, 1.5–1.6 mm long, 0.4–0.5 mm wide, yellow. Stigma c. 1.6 mm long and 1 mm diameter, yellow. Fruit 3-locular.

**Specimens examined.** Queensland. LEICHHARDT DISTRICT: c. 20 km NNW of Moura, 3 km SE of "Bindaree", 24°22'S, 149°55'E, May 1984, *Thompson* [AQ440572] (BRI); "Martindale", Taroom Shire, Apr 1983, *Gray* [AQ393576] (BRI); Charvel, Theodore, *House* [AQ010656] (BRI). PORT CURTIS DISTRICT: c. 20 km NW of Biloela, May 1984, *Thompson* [AQ440571] (BRI); Experimental farm, Biloela, Oct 1947, *Smith* 3476 (BRI). BURNETT DISTRICT: 4 km NW of "Toondahra", 25°57'S, 151°21'E, Sep 1985, *Forster* 2241 (BRI,K); ditto, Dec 1987, *Forster* 3314 (BRI,QRS); 3 km WNW of "Toondahra", 25°58'S, 151°21'E, Nov 1988, *Forster* 4828 (BRI,K,MO).

**Etymology:** The epithet alludes to the predominantly relictual/remnant nature of the vegetation communities due to land clearing, in which both the hybrid and the parent species occur.

### Acknowledgements

The Directors of BRI, NE and QRS allowed access to collections at their institutions. M.P. Bolton, Tropical Weeds Research Centre, Department of Lands, Charters Towers organised several trips on which material was collected. Special collections were made by G.I. Forster. Some material was collected on trips with P.D. Bostock, D.J. Liddle, D. Orford and M.C. Tucker. L.H. Bird and D. & N. Hoy provided information on the localities of some populations. R. Henderson corrected the latin diagnosis. Permits to collect were issued by the Queensland Department of Forestry for various lands administered by that Department. All of this assistance is gratefully acknowledged.

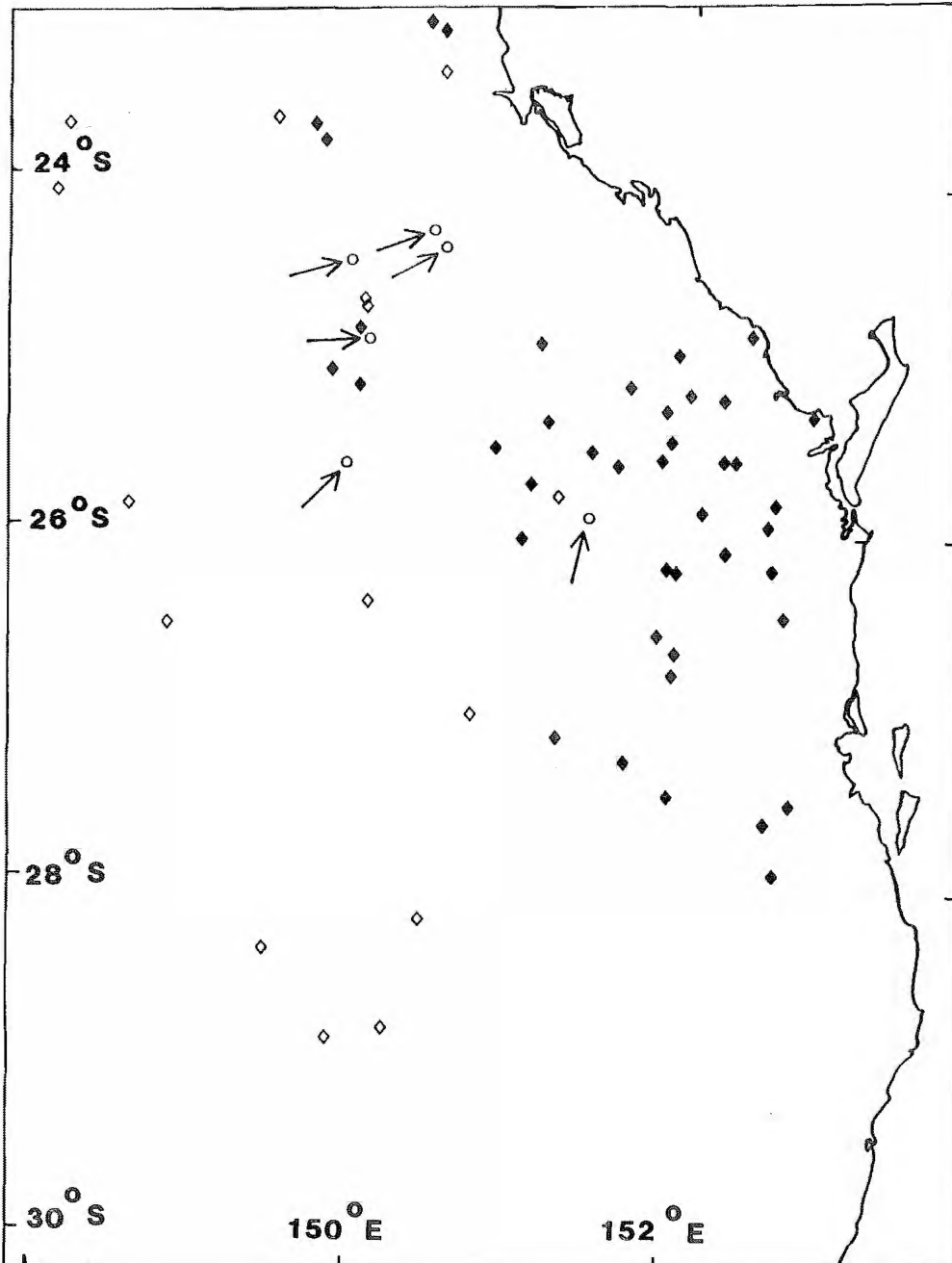
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### Appendix 1. Selected specimens.

#### *Owenia venosa* F. Muell.

Queensland. PORT CURTIS DISTRICT: Johnson Ck, 1 km N of Mt Etna, 23°09'S, 150°27'E, Jun 1989, *Forster* 5110 & *Vavrym* (BRI). LEICHHARDT DISTRICT: Isla Gorge, Aug 1973, *Sharpe* 655 & *Hockings* (BRI); W slopes of Gogango Range, c. 20 km ESE of Duaringa, 23°45'S, 149°51'E, Jun 1983, *Anderson* 3430 (BRI); near Ghinghindah, May 1977, *Olsen* 3576 & *Byrnes* (BRI). BURNETT DISTRICT: Hurdle Gully S.A. 33, Coomingleah S.F. 1674, 24°54'S, 151°01'E, Jan 1988, *Forster* 3428 (BRI,K); 4.5 km NNE of Monogorilby, 26°01'S, 151°01'E, Dec 1987, *Forster* 3318 (BRI,DNA); Edenvale Hill near Kingaroy, Dec 1947, *Michael* 3084 (BRI). WIDE BAY DISTRICT: The Hummock, near Bundaberg, Dec 1938, *Goy* & *Smith* 614 (BRI); Kepnock, 24°52'S, 152°22'E, Oct 1948, *Smith* 4160 (BRI); Cordalba S.F. 832, 10 km NNE of Booyal, 25°08'S, 152°04'E, Jan 1988, *Forster* 3342, *Tucker* & *Orford* (BRI,K); Bellevue Scrub, Dundowran via Nickenbah, Jul 1928, *Tryon* [AQ060779] (BRI); Didcot Ck, 25°28'S, 151°54'E, Dec 1987, *Forster* 3315 (BRI,K,MO); Theebine, Nov 1921, *White* [AQ060783] (BRI); 15 km W of Gympie, 26°15'S, 152°40'E, Sep 1977, *Anning* CF1 (QRS); near Imbil, Jun 1947, *Smith* & *Webb* 3140 (BRI); DARLING DOWNS DISTRICT: Reserve 197, near Dalby, Dec 1943, *Jennings* [AQ060767] (BRI); Highfields, *Bailey* [AQ060778] (BRI). MORETON DISTRICT: S.F. 289 Yarraman, 26°49'S, 151°57'E, Nov 1973, *Moriarty* 1501 (CANB,QRS); Flinton Hill, Worlds End Pocket, 27°31'S, 152°45'E, Dec 1987, *Forster* 3308 (BRI,MEL); Pine Mt, Nov 1983, *Bird* [AQ419917] (BRI); Rosewood, May 1913, *White* [AQ060775] (BRI).



Map 1. Distribution of *Owenia acidula*, *O. venosa* and hybrids in south-east Queensland based on holdings at BRI, NE and QRS and field observations by the author.  $\diamond$  *O. acidula*,  $\blacklozenge$  *O. venosa*,  $\circ$  *O. x reliqua*, highlighted by arrows.

*Owenia acidula* F. Muell.

Northern Territory. Gidyea Ck, Lake Nash, 20°58'S, 137°55'E, Oct 1955, *Michael* [AQ060744] (BRI,NE); "Murray Downs", Jul 1954, *Winkworth* 525 (BRI). Queensland. COOK DISTRICT: between Petford & Dimbulah, 17°15'S, 145°00'E, Dec 1974, *Hyland* 7936 (BRI,QRS). BURKE DISTRICT: Nonda between Hughenden & Cloncurry, *Hubbard* 7248 & *Winders* (BRI); Hughenden, Nov 1935, *Blake* 10066 (BRI,CANB). GREGORY NORTH DISTRICT: Carandotta, SE of Urandangie, Nov 1935, *Blake* 10174 (BRI,CANB). GREGORY SOUTH DISTRICT: Quilpie, Aug 1928, *Francis* [AQ060739] (BRI). NORTH KENNEDY DISTRICT: 5 km from "Fletcher Dale", Charters Towers to "Hillgrove", Gregory Developmental Road, 19°52'S, 146°06'E, Mar 1988, *Forster* 3632 & *Bolton* (BRI); 2.5 km S of "Doongara", 20°35'S, 146°29'E, Mar 1988, *Forster* 3733 (BRI). WARREGO DISTRICT: c. 30 km by road N of Thargomindah, Jun 1955, *Smith* 6347 (BRI). LEICHHARDT DISTRICT: Dysart, 22°05'S, 148°10'E, Aug 1977, *McConnell* 14 (QRS); 2 km S of Nipan saleyards, 24°47'S, 150°01'E, Mar 1988, *Forster* 3602 (BRI,K); Kianga Railsiding, 24°47'S, 150°01'E, Mar 1988, *Forster* 3603 (BRI,K). MITCHELL DISTRICT: 30 miles [50 km] SE of Barcaldine, Nov 1939, *Everist* 1926 (BRI). MARANOVA DISTRICT: Roma, May 1934, *Blake* 5827 (BRI). BURNETT DISTRICT: 34 km S of Mundubbera, Dec 1981, *Kent* [AQ347163] (BRI). DARLING DOWNS DISTRICT: "Kindon", 54 miles [90 km] NNE of Goondiwindi, Dec 1938, *Smith* 597 (BRI); 28 miles [47 km] N of Talwood, Oct 1970, *McDonald* 474 (BRI). New South Wales. Bullala S.F., Sheeba Downs turnoff, Jan 1988, *Mackay* [NE46140A] (NE); road to "Janbeth", c. 5 km NW of Bourke, 30°24'S, 145°54'E, Apr 1985, *James* 739 (BRI); Gurley, Nov 1914, *Breakwell* [AQ060746] (BRI).

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